SMART GARBAGE MONITORING SYSTEM

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I/We* hereby declare that I/We* have checked this thesis/project* and in my/our* opinion, this thesis/project* is adequate in terms of scope and quality for the award of the degree of *Doctor of Philosophy/ Master of Engineering/ Master of Science in ……..

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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Date : 3 JANUARY 2019

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
Bachelor of Computer Science (Computer Systems & Networking)

Faculty of Computer System and Software Engineering

UNIVERSITI MALAYSIA PAHANG

JANUARY 2019

ACKNOWLEDGEMENTS

I would like to express my appreciation and thanks to my supervisor, Dr. Ramdan Bin Razali, whose help for the ideas, give encouragement, advises, and correcting my mistake throughout completing this final year project. Special thanks to fellow students under same supervisor that give support for this project. I also lie to thanks to my parents that always support me in many ways.

I'm also wanted to give some gratitude to all lecturers in Faculty of Computer System and Software Engineering for helping me directly or indirectly. Other than that, I also want to thanks my friends for giving their support whenever I need it to complete this project.

ABSTRAK

Antara salah satu cabaran untuk berinovasi dan mencipta penyelesaian IOT membolehkan dalam pemantauan dan pengurusan alam sekitar. Pengumpulan produk sampah menggunakan Internet Thing (IoT) dengan teknologi sensor wayarles pintar yang akan dapat mengumpulkan data dari tong sampah. Ini salah satu cabaran kepada pihak berkuasa tempatan ialah bagaimana memantau karya pekerja yang berkesan dan cekap dalam pengurusan sisa. Dari hasil penyelidikan ini, dapat disimpulkan bahwa, di satu pihak, aplikasi ICT, melalui pengurusan mengumpulkan data dari sukarelawan oleh pihak yang berkepentingan, dapat meningkatkan visualisasi sistem manajemen sisa pintar cerdas. Dokumentasi ini akan memberi maksud kepada pihak berkuasa tempatan pelaksanaan pengurusan sisa pintar untuk meningkatkan dan meningkatkan pengurusan bandar, dan menyediakan perkhidmatan yang lebih baik kepada orang ramai ke arah aplikasi pintar bandar.

ABSTRACT

One of the challenges to transform and make an Internet of Things (IoT) is in monitoring and managing of the environment. One of the challenges to the local authority is how to monitor the works of employee effective and efficiency in waste management. Waste product collection utilizes the IoT with the technology of sensors that will able to collect the data from a garbage bin. From the finding of this investigation, it can be concluding that through management of collecting data from the volunteer by stakeholders can enhance the visualization of intelligent smart waste management system. This documentation will purpose to the local authority the implementation of smart waste management to provide better services to the public towards smart city applications and improve and increase the city management.

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CHAPTER 1

INTRODUCTION

1.1 Project Background

In this era, we are living in age where everything must be done in a short time but efficient. Tasks and systems are fusing together with the influence of Internet of Thing (IoT) to have a more fast and efficient system of working. IoT is the network of associated physical objects that can interconnect and interchange data among themselves without human intervention. IoT permits human to gather information and data from all kind of medium. IoT is unalike Internet as it aiding everyday objects to communicate with each other using the existing Internet technology.

One of the main concerns during this present era is solid waste management. Lack of monitoring and managing solid waste has affects the health and environment of our society. The manual way of monitoring the waste is an inefficient process and use more human effort, time and cost. This inefficient process can be avoided with present technologies.

The garbage truck use to go around the town to collect garbage every three days. This system was very inefficient as the garbage fills up really fast and spill out from the garbage bin in a crowded area or the garbage bin is not even half full after two days in a seclude area. It can lead to an unhealthy environment and smell pollution.

In this paper, the proposed system is the immediate collecting the garbage called Smart Garbage Monitoring System. This garbage monitoring system helps solve this problem as an ultrasonic device on top of a garbage bin will detecting and collect the data that the volume of the waste product has reached its maximum value from its threshold value and then, transmit the status to mobile phone via SMS. This system also can detect a garbage bin that half full but it is two or more days old. This is to prevent smell environment. Then, the data transmitted to the hand phone via SMS.

1.2 Problem Statement

The disadvantage of the existing system are that the environmental companies cannot assume the volume of solid waste in garbage bin daily so the employees have to check the garbage bins every day resulting in high cost. Because of that, the garbage bin is over spilled. It can attract pests and lead to unhealthy environment.

Another problem that needs to be solved is the age of the garbage. If supposing a particular garbage bin is not even full and then for a week, the garbage truck not collect the garbage, it will start rotting and leading to a smelly surrounding. Therefore, this proposed system will tackle the problem with our system's tolerance level is set to two days so if the garbage bin is not full but it is two days old it then also need to be emptied.

Table 1.1 Problem Statement of Smart garbage Monitoring System.

No.	Problem	Description	Effect
1	Volume of solid waste	The environmental management company cannot assume the volume of solid waste in garbage bin in a day.	Over spilled of garbage bin can attract pests and it can lead to unhealthy environment
2	Time	The garbage is two or more days old as the garbage trucks not collect it because the bin is not even full.	It can lead to smell pollution and the society will live in an uncomfortable environment

1.3 Goal / Aim & Objectives

1.3.1 Goal / Aim

The goal for this project is to develop a real-time garbage monitoring system for UMP.

1.3.2 Objectives

The objectives of this project are:

i. To build a garbage monitoring system.

ii. To send the garbage volume status to mobile phone by sending SMS.

1.4 Scope

The scopes of the project are:

i. To focus on detection of volume and age of waste product in garbage bin and the data is transmitted to hand phone by sending SMS.

ii. To focus on the installation of Arduino UNO, ultrasonic sensor and GSM module.

iii. To focus on testing the system can detect the volume of garbage and transmit the data to user.

1.5 Significance

The significance of this project is:

i. Facilitate environmental management company in making a better environment of society.

ii. Improve the previous project by adding an additional feature.

1.6 Report / Thesis Organisation

This thesis for smart garbage monitoring system project comprises of five chapters. Chapter 1 discusses on introduction of project. Chapter 2 discusses about literature review, where we describe the existing systems. Chapter 3 discusses about methodology. Implementation, testing and results will be discussed on Chapter 4. Finally, in Chapter 5 will conclude the entire project of smart garbage management system.

REFERENCES

Waste Container (n.d). Retrieved from https://en.wikipedia.org/wiki/Waste_container.

Arduino UNO (n.d). Retrieved from https://en.wikipedia.org/wiki/Arduino_Uno

Lakshay S. (2016, April 17). Waterfall Model. Retrieved from http://toolsqa.com/software-testing/waterfall-model/

Monika KA., Nikitha R., Prapulla SB. & Shobba G (2016). Smart Dustbin - An Efficient Garbage Monitoring System. *International Journal of Engineering Science and Computing, 6*(6), doi: 10.4010/2016.1694.

Tambare P. & Venkatachalam P. (2016). IoT Based Waste Management for Smart City. *International Journal of Innovative Research in Computer and Communication Engineering, 4*(2), 1267-1274. doi:110.15680/IJIRCCE.2016. 0402029.

Kasliwal Manasi H. & Suryawanshi Smitkumar (2016). A Novel Approach to Garbage Management Using Internet of Things for Smart Cities. *International Journal of Current Trends in Engineering & Research, 2*(5), 348-353.

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